

Element/Isotope/Ion/Nuclide Symbol

Name: Key

Definitions:

Element: ~An atom with the same number of protons (p^+)~ Atoms with the same atomic number (# of p^+)

~ If you change the number of protons, you change the element

Isotope: ~An element with the same number of protons (p^+), but different numbers of neutrons (n^0)

~ Each element has several isotopes. Some are stable, while some are unstable.

~ If you change the number of neutrons, you change the mass AND the isotope.

Ion: ~ An atom with a charge~ Neutral atoms are not ions because the Charge is "0" ($\#p^+ = \#e^-$)~ An ion is created when electrons are lost or gained. ($\#p^+ \neq \#e^-$)

~ If you change the number of electrons, you change the charge

~ Two types of Ions:

~ Cation = positive charge (more p^+ than e^-) - loses electrons~ Anion = negative charge (more e^- than p^+) - gains electronsNuclide Symbol: Symbolic way to represent the quantity of protons, neutrons and electrons that can be found in an atom~ Ex: ${}^{AM}_{AN}X^{\text{Charge}}$

~ X = Any Symbol to represent an element (He = Helium)

~ AN = Atomic Number = $\#p^+$ ~ AM = Atomic Mass = $\#p^+ + \#n^0$ ~ Charge = $\#p^+ - \#e^-$ Isotope Symbol: Symbolic way to represent the isotope's mass

~ Ex: Carbon-14 or C-14

~ Atom is identified through the name or symbol

~ Mass is identified through the number

~ When using this symbol, the charge is undetermined

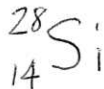
Problems: Write the nuclide symbol with the following information: $p^+=13$, $n^0=14$ & $e^-=13$ ~ Step 1 = If $p^+=13$, then you must be talking about Aluminum (Al). The atomic # = 13.~ Step 2 = If there are $13p^+$ and $14n^0$, then the atomic mass must be 27 ($13+14$).~ Step 3 = If there are $13p^+$ and $13e^-$, then the charge must be 0 ($13-13$).~ Step 4 = Use the information to write the nuclide symbol: ${}^{27}_{13}\text{Al}^0$ or ${}^{27}_{13}\text{Al}$

For questions 1-3, write the nuclide symbol from the following information.

1) $p^+ = 20$
 $n^0 = 20$
 $e^- = 18$



2) $p^+ = 14$
 $n^0 = 14$
 $e^- = 14$



3) $p^+ = 17$
 $n^0 = 18$
 $e^- = 18$



For questions 4-6, use the nuclide symbol to determine the quantity of p^+ , n^0 & e^- .

4) $^{40}_{18}\text{Ar}$

$p^+ = 18$
 $n^0 = 22$
 $e^- = 18$

5) $^7_3\text{Li}^{+1}$

$p^+ = 3$
 $n^0 = 4$
 $e^- = 2$

6) $^{19}_9\text{F}^{-1}$

$p^+ = 9$
 $n^0 = 10$
 $e^- = 10$

For questions 7-9, use the isotope symbol to determine the quantity of p^+ , n^0 & e^- .

7) Bromine-80

$p^+ = 35$
 $n^0 = 45$
 $e^- = 35^*$

8) Silver-109

$p^+ = 47$
 $n^0 = 62$
 $e^- = 47^*$

9) Sulfur-32

$p^+ = 16$
 $n^0 = 16$
 $e^- = 16^*$

* ASSUMED NEUTRAL

For questions 10-14, fill in all of the missing values in the chart below:

	10)	11)	12)	13)	14)
Isotope Symbol	Phosphorus-31	Be-9	Fe-56	Kr-84	Se-79
Protons	15	4	26	$84 - 48 = 36$	34
Neutrons	$31 - 15 = 16$	5	$56 - 26 = 30$	48	$79 - 34 = 45$
Electrons	18	2	23	36	$34 + 2 = 36$
Atomic Mass	31	9	56	84	79
Nuclide Symbol	$^{31}_{15}\text{P}^{-3}$	$^9_4\text{Be}^{+2}$	$^{56}_{26}\text{Fe}$	$^{84}_{36}\text{Kr}$	$^{79}_{34}\text{Se}^{-2}$